

Slide 1 (Title slide):

Welcome to the amazing world of marine plankton. (click)

Slide 2:

So what exactly are plankton? The term plankton comes from the Greek word “Planktos” meaning wanderer or drifter. (click) Plankton are organisms that live in the water and cannot swim against major currents. Plankton can be classified into two main groups: plants (click) and animals (click). (click)

Slide 3:

The plant-like plankton are called phytoplankton. You can remember that phytoplankton are like plants because plants and phyto both begin with the letter p. Each phytoplankton is a single cell or a chain of cells (click). Phytoplankton are microscopic: that means they are incredibly small. The picture shown here (click) was taken through a microscope. The phytoplankton in this image has been magnified hundreds of times. As you can see, it doesn't look anything like plants that grow on land. Phytoplankton don't have roots, stems, or leaves. But like land plants, they are able to capture sunlight and convert it into food. This process, called photosynthesis, also makes the oxygen that we need to breathe. In fact, phytoplankton produce about 50% of the oxygen that you breathe every day! That's not an easy task, but fortunately there are plenty of phytoplankton to get the job done. (click) In a teaspoon of sea water, you can find over a million phytoplankton! (click) When conditions are just right, phytoplankton can grow in such large numbers that they are able to generate a bloom that can be seen from space. (click)

Slide 4:

The animal-like organisms that drift in the ocean are called zooplankton. You can remember that zooplankton are like animals because animals live in a zoo. These creatures are larger than phytoplankton, but most are still quite small. (click) You can view most zooplankton by using a magnifying glass. One notable exception (click) are jellyfish, which can be seen without a magnifying glass. Some jellyfish species can grow to over several meters in length – which of course requires no magnification at all. (click)

Slide 5:

Phytoplankton live near the surface of the ocean close to the sun because they need sunlight to make food. The shape of the phytoplankton keeps them from sinking too far below the surface of the ocean. Phytoplankton that are balled up will sink (click) just like you do when you jump into the pool as a cannonball. Phytoplankton that are long and spread out will float (click) just like when you float on your back with your arms and legs spread out. These (click) are some examples of long, spread out shapes that help phytoplankton stay near the surface. Some phytoplankton (click) even link together to form chains to stay afloat. (click)

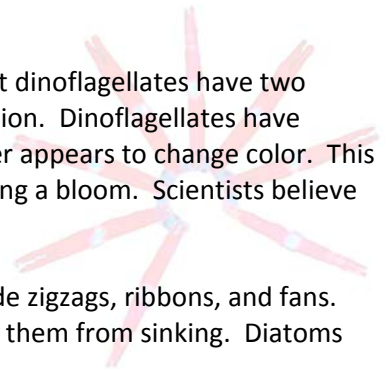
Slide 6:

Two common types of phytoplankton that you will learn about today are dinoflagellates (click) and diatoms (click). (click)

Slide 7:

Phytoplankton have special adaptations, or modifications, for survival in the ocean. Most dinoflagellates have two flagella (click) that help them move through the water, and a hard shell (click) for protection. Dinoflagellates have pigments of various colors and, when there are a lot of them in one area, the ocean water appears to change color. This is called a bloom (click). Toxins are sometimes released into the surrounding waters during a bloom. Scientists believe that these toxins may protect dinoflagellates from predators. (click)

Diatoms are another type of plant-like plankton. They come in varying shapes that include zigzags, ribbons, and fans. They have a protective cell wall (click) made of glass, and their spines (click) help prevent them from sinking. Diatoms also form chains (click) which help keep them near the surface. (click)



Slide 8:

There are two types of zooplankton: temporary and permanent. The temporary zooplankton called meroplankton (click) only spend part of their life cycle as plankton. The permanent zooplankton called holoplankton (click) spend their whole life as plankton. You can remember that holoplankton spend their whole life as plankton because *holo* and *whole* sound similar. (click)

Slide 9:

Certain animals, such as crabs and fish, are plankton only when they are young larva. When they grow up, they transform into completely different forms. As a crab grows up (click), it sinks to the ocean floor which is the natural habitat for an adult crab. A fish larva (click) grows up to be a fish with excellent swimming capabilities. In both cases, they are plankton only when they are young. (click)

Slide 10:

The other type of zooplankton (called holoplankton) spends its whole life drifting around the ocean. Here are some examples of holoplankton. Copepods (click) are the most abundant animals in the ocean, and perhaps anywhere on Earth. (click)

Slide 11:

Plankton are really important because they form the base of the marine food web. Phytoplankton (click) obtain their energy from the sun through photosynthesis. Phytoplankton are eaten by zooplankton (click), which are then eaten by small fish (click). Small fish get eaten by medium fish (click), which are in turn eaten by large fish (click), such as tuna. Sharks (click) are at the top of the food web. Without plankton (click), none of the larger fish or animals in the ocean could survive. The entire marine food web would collapse. (click)

Slide 12:

So how do scientists study plankton? First, they conduct a plankton tow to collect the tiny organisms. Plankton are very common in the ocean, but they are often very spread out. Scientists tow plankton nets (click) slowly behind a boat to concentrate the plankton. These nets have small holes, which are large enough to allow water to pass through but small enough to trap the plankton inside. The phytoplankton and zooplankton get forced into a bucket (click) at the narrow end of the net. Scientists collect the plankton from the bucket, and investigate them with a magnifying glass or microscope. These pictures (click) show high school students collecting plankton with a net (click), and examining their findings under a microscope. (click)

Slide 13:

In summary, the plant-like plankton are called phytoplankton. Phytoplankton (click) cannot swim against major currents. All phytoplankton (click) spend their whole life as plankton. Phytoplankton (click) are important because they produce half of the oxygen that we breathe each day! Phytoplankton (click) have spines, chains, and hard shells. These adaptations protect them from predators and help them stay close to the surface where sunlight is most abundant. (click)

Slide 14:

Animal-like plankton are called zooplankton. (click) Like phytoplankton, zooplankton cannot swim against major ocean currents. Some zooplankton are plankton only when they are young. (click) They are called meroplankton or temporary plankton. For example, this zooplankton (click) becomes a crab when it grows up. Other zooplankton (click) called holoplankton spend their whole lives as plankton. Both zooplankton and phytoplankton (click) make up the base of the marine food web: without these tiny organisms, no fish could survive.

